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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/744,363 | 02/21/2001 | Shinji Nakahara | 01017/LH | 4454 |

7590 11/06/2003

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| EXAMINER |
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MOORE, KARLA A.

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| ART UNIT | PAPER NUMBER |
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1763

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,363

Applicant(s)

NAKAHARA ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 06-267855 to Suzuki in view of Japanese Patent No. 19-129553 A to Minagawa, U.S. Patent No. 5,094,885 to Selbrede and U.S. Patent No. 5,458,322 to Kulkaski et al.

3. Suzuki discloses an epitaxial growth furnace comprising: a sealed chamber (Figure 3, 65); and a pair of wafer holders for holding a pair of semiconductor wafers within said chamber; wherein formation of an epitaxial layer on a surface of each of said wafers is effected by supplying under a high temperature condition a source gas (66, see abstract) to a surface area of said wafers; wherein said surface areas are subject to epitaxial growth from within said reaction chamber; and wherein each of said holders comprises: an opening for exposing one of said surface areas of the wafers to said reaction chamber; an opening flange (Figure 1,12a) adapted for engagement with a chamfered tapered surface of a whole peripheral edge of one of said wafers on the side of said surface area thereof.

4. However, while Suzuki discloses alternative arrangements (Figures 3, 5, 6,8,9) for the wafer holders within the reaction chamber, Suzuki fails to disclose wafer holders that are adapted to arrange said pair of wafers in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed between said wafers. With respect to claim 5, Suzuki further fails to disclose said pair of wafer holders are adapted for vertical arrangement of said pair of semiconductor wafers so that the wafers are placed upright with each wafer surface vertically arranged.

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5. Minagawa discloses a vapor epitaxial growth device and method comprising a pair of wafer holders arranged in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed between said wafers for the purpose processing two or more substrates at one time, preventing foreign objects from adhering to the surfaces of the wafers, lessening floor space used and efficiently using material gas (problem to be solved, solution).

6. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a pair of wafer holders arranged in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed between said wafers in Suzuki in order to process two or more substrates at one time, prevent foreign objects from adhering to the surfaces of the wafers, lessen floor space used and efficiently use material gas as taught by Minagawa.

7. Suzuki further fails to disclose a plurality of jaws for detachably engaging with an outer periphery of one of the wafers on a back surface side of said surface area thereof.

8. Selbrede discloses a plurality of jaw means/flexible wafer supports (23, 25) for detachably engaging with an outer periphery of the wafer on a back surface side of said surface area for the purpose of supporting a wafer (27) during processing (column 5, rows 41-44) with minimal contact area (column 5, rows 52-54).

9. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of jaws for detachably engaging with an outer periphery of the wafer on a back surface side of said surface area in Suzuki in order to support a wafer during processing with minimal contact area as taught by Selbrede.

10. Suzuki, Minagawa and Selbrede disclose the invention substantially as claimed and as described above.

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11. However, Suzuki, Minagawa and Selbrede fail to disclose that the jaws further comprise a plurality of springs for respectively thrusting each said jaws toward a center of said opening, and detachable actuating means for locking of said jaws in a released position against respective thrust forces from said springs.

12. Kulkaski et al. disclose jaws with springs (Figures 1-3,13) and detachable actuating means (31; column 3, rows 57-65) for locking each jaw in a released position against the thrust force from said springs means for the purpose of installing and removing a substrate from the jaws.

13. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided spring means and detachable actuating means in Suzuki, Minagawa and Selbrede in order to install and remove substrates from jaw means as taught by Kulkaski et al.

14. With respect to claim 2, the opening flange of each of said wafer holders is adapted to contact only with the chambered tapered face of the whole peripheral edge of one of said wafers on the side of said surface area thereof which is subject to epitaxial growth.

15. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Minigawa, Selbrede and Kulkaski et al. as applied to claims 1, 2 and 5 above, and further in view of European Patent Application No. 840 358 to Balance et al.

16. Suzuki, Minigawa, Selbrede and Kulkaski et al. disclose the invention substantially as claimed and as described above.

17. However, Suzuki, Minigawa, Selbrede and Kulkaski et al. fail to disclose an inclined face corresponding to the edge of the wafer on said back surface side thereof.

18. Balance et al. disclose a sloped substrate support for the purpose of reducing the effect and severity of scratches on the substrate caused by the support thereby improving substrate yield (abstract).

19. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have included an inclined face corresponding to the edge of the wafer on said back surface side thereof in Suzuki, Minigawa, Selbrede and Kulkaski et al. in order to reduce the effect and severity of

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scratches on a substrate caused by the support thereby improving the substrate yield, as taught by Balance et al.

Response to Arguments

20. Applicant's arguments filed in a paper received on 08/04/2003 have been fully considered but they are not persuasive.

21. Firstly, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Examiner recognizes that Suzuki fails to teach moving parts for detachably holding a substrate, accordingly, Selbrede was cited to supplement subject matter that Suzuki lacked.

22. Secondly, with respect to Applicant's argument that Selbrede fails to teach the plurality of jaws only on the back surface side of a wafer, Examiner disagrees. In Figures 2 and 5, the jaws are illustrated as clearly only contacting the back surface side of a wafer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
3 November 2003

primary Examiner
AV 1763
P. Hassanzadeh